

11X
H

JOURNAL OF THE EAST AFRICA NATURAL HISTORY SOCIETY AND NATIONAL MUSEUM

Smithsonian
120 60 1992
Library

OCTOBER 1984

No. 181

CHECKLIST OF THE SPECIES OF TERMITES (ISOPTERA) RECORDED FROM EAST AFRICA

K. Wanyonyi*, J.P.E.C. Darlington+, and R.K.N. Bagine+

*International Centre of Insect Physiology and Ecology,
P.O. Box 30772, Nairobi, Kenya.*

INTRODUCTION

This checklist is based on one originally prepared by Kisito Wanyonyi during a period of training in Switzerland and Britain. It was apparently intended to form part of a thesis or handbook which he never completed. After his death in 1975 the list was used for reference by members of the Termite Research Programme at I.C.I.P.E.. This programme finally closed down in 1982.

In 1983 the termite collection of the National Museums of Kenya was reorganised and catalogued. It seemed an opportune moment to revise and update the checklist, and to publish it. The revision was carried out by J.P.E.C. Darlington, formerly of I.C.I.P.E., and R.K.N. Bagine of the National Museums of Kenya.

The list includes 177 species, of which two are recent introductions. Of the 32 species recorded only from Uganda, most probably belong to the fauna of the West African savannas, or are relicts of the Congo Forest which was formerly more extensive. The remaining 143 species comprise the East African fauna proper which is continuous with that of Somalia, Ethiopia and Sudan to the North, and of Malawi, Zimbabwe and Mozambique to the South. The actual distribution of species is closely linked to vegetation zones (Bouillon 1970).

This list is not definitive but merely a statement of the *status quo*. The taxonomy and distribution of East African termites are incompletely known, especially in the un-revised taxa, and future work will certainly lead to changes in the list, both by the addition of newly-described species and by the suppression of species names which are found to be synonymous.

The known distribution of each species in East Africa is coded in the list as follows: U = Uganda, K = Kenya, T = Tanzania, mainland only, Z = Zanzibar Island (Tanzania).

SOURCES

In revising the list the following published sources have been used: Snyder (1949) for all groups that have not subsequently been revised; Harris (1966a) for the genus *Coptotermes*; Sands (1972) for the subfamily Apicotermitinae; Sands (1959) for the genus *Amitermes*; Williams (1966) for the genus *Cubitermes*; Ruelle (1970, 1977) for the genus *Macrotermes*; Harris (1966b) for the genus *Ancistrotermes*; and Sands (1957) for the subfamily Nasutitermitinae, eastern group only. The "Catalogue ethiopien" of Bouillon and Mathot (1965, 1966) was also consulted. Additional distribution records from Harris (1951) and Kemp (1955) have been included. The layout of the checklist follows Snyder (1949) except in the family Termitidae in which the revised arrangement of Sands (1972) is used.

Distribution records derived from the published sources mentioned above are quoted in the list without a subscript. Records derived solely from unpublished sources are indicated by a subscript, as follows:

* Deceased

+ Present address: Section of Entomology, National Museums of Kenya, P.O. Box 40658, Nairobi.

1. Wanyonyi's original list dated 1972. This was compiled from two main sources:
 - a) Unpublished catalogue and notes of Dr. E. Ernst of the Schweizerisches Tropeninstitut, Basle, Switzerland.
 - b) Records of the Termite Research Unit, Centre for Overseas Pest Research, London. This included unpublished collection data of W.A. Sands and R.M.C. Williams; and a catalogue, updated by R.W. Lamb, of the termite collection housed in the Entomology Department, British Museum (Natural History).
2. A termite collection donated to the National Museums of Kenya by W. Wilkinson of the East African Agriculture and Forestry Research Organisation, Muguga, Kenya.
3. Termites collected by J.P.E.C. Darlington, D.E. Pomeroy, K. arap Rotich, R.K.N. Bagine and others, most of which were identified by S. Bacchus of the C.O.P.R. Termite Research Unit, London. The material is housed partly in the National Museums of Kenya and partly in the British Museum (Natural History).
4. An unpublished thesis by Buxton (1979) whose identifications were checked by W.A. Sands and R.M.C. Williams and whose material is deposited at the British Museum (Natural History) in London.

FAMILY KALOTERMITIDAE

Subfamily Kalotermitinae

Genus *Epicalotermes* Silvestri, 1918

<i>E. aethiopicus</i> Silvestri, 1918		K ₁	
<i>E. kempae</i> (Wilkinson, 1954)		K _{2,4}	T
<i>E. mkuzii</i> (Coaton, 1949)			T

Genus *Neotermes* Holmgren, 1911

<i>N. aridus</i> Wilkinson, 1959		K	
<i>N. cryptops</i> (Sjöstedt, 1900a)	U ₁		T
<i>N. firmus</i> (Sjöstedt, 1911a)		K	
<i>N. meruensis</i> (Sjöstedt, 1907a)		K	T

Genus *Bifiditermes* Krishna, 1961

<i>B. angulatus</i> (Wilkinson, 1959)			T
<i>B. durbanensis</i> Haviland, 1898		K ₂	T
<i>B. jeannelanus</i> (Sjöstedt, 1915)	U	K	T
<i>B. sibayensis</i> (Coaton, 1949)			T ₁
<i>B. sylvaticus</i> (Wilkinson, 1959)	U	K	

Genus *Cryptotermes* Banks, 1906

<i>C. dudleyi</i> Banks, 1918 (introduced)			T
<i>C. havilandi</i> (Sjöstedt, 1900b)	U	K	T

Genus *Glyptotermes* Froggatt, 1896

<i>G. ignotus</i> Wilkinson, 1959	U		
<i>G. kawandae</i> Wilkinson, 1954	U		
<i>G. parki</i> Krishna & Emerson, 1962	U		
<i>G. parvulus</i> (Sjöstedt, 1907b)	U		
<i>G. reticulatus</i> Wilkinson, 1954			Z
<i>G. uelensis</i> Coaton, 1955	U ₁		

Genus *Bicornitermes* Krishna, 1961

<i>B. bicornis</i> Krishna, 1961	U ₁		
<i>B. spinicollis</i> (Wilkinson, 1958)			T

ERRATA

page 4 line 30

"M. sp." add "near notandus Silvestri 1914-15"

page 5 line 6

"genus Ceratotermes Silvestri 1914-15" delete and substitute

"genus Foraminitermes Holmgren 1912"

page 5 line 7

"C. rhinoceros (Sjöstedt, 1905) U T" correct to read

~~F~~ "C. rhinoceros (Sjöstedt, 1905) U K_3 T"

These changes are made to conform with the synonymy established by KRISHNA K., 1963. The African genus Foraminitermes Holmgren (Isoptera, Termitidae, Termitinae). American Museum Novitates 2161: 1-23.

FAMILY HODOTERMITIDAE

Subfamily Hodotermitinae

Genus *Hodotermes* Hagen, 1853

<i>H. mossambicus</i> (Hagen, 1853)	U	K ₃	T
-------------------------------------	---	----------------	---

FAMILY RHINOTERMITIDAE

Subfamily Coptotermitinae

Genus *Coptotermes* Wasmann, 1896

<i>C. amanii</i> (Sjöstedt, 1911b)			T	Z
------------------------------------	--	--	---	---

<i>C. formosanus</i> Shiraki, 1909 (introduced)	U	K ₂		
---	---	----------------	--	--

<i>C. sjöstedti</i> Holmgren, 1911			T	
------------------------------------	--	--	---	--

Subfamily Rhinotermitinae

Genus *Schedorhinotermes* Silvestri, 1909

<i>S. lamanianus</i> (Sjöstedt, 1911c)	U	K	T	Z
--	---	---	---	---

<i>S. putorius</i> (Sjöstedt, 1896)	U			
-------------------------------------	---	--	--	--

FAMILY TERMITIDAE

Subfamily Apicotermatinae

Genus *Apicotermes* Holmgren, 1912

<i>A. holmgreni</i> Emerson, 1956			T ₁
-----------------------------------	--	--	----------------

Genus *Astalotermes* Sands, 1972

<i>A. amicus</i> Sands, 1972			T
------------------------------	--	--	---

<i>A. hapalus</i> Sands 1972		K	
------------------------------	--	---	--

Genus *Astratotermes* Sands, 1972

<i>A. apoenetus</i> Sands, 1972		K	
---------------------------------	--	---	--

<i>A. mansuetus</i> Sands, 1972		K	
---------------------------------	--	---	--

Genus *Allyscotermes* Sands, 1972

<i>A. kilimandjaricus</i> (Sjöstedt, 1907a)	U	K	T
---	---	---	---

<i>A. trestus</i> Sands, 1972		K	
-------------------------------	--	---	--

Genus *Ateuchotermes* Sands, 1972

<i>A. pectinatus</i> Sands, 1972	U	K	
----------------------------------	---	---	--

<i>A. rastratus</i> Sands, 1972		K	T
---------------------------------	--	---	---

Genus *Anenteotermes* Sands, 1972

<i>A. disluctans</i> Sands, 1972	U		
----------------------------------	---	--	--

<i>A. improelatus</i> Sands, 1972		K	
-----------------------------------	--	---	--

Genus *Aderitotermes* Sands, 1972

<i>A. fossor</i> Sands, 1972	U	K	T
------------------------------	---	---	---

Genus *Adaiphrotermes* Sands, 1972

<i>A. choanensis</i> (Fuller, 1925)		K ₄	T
-------------------------------------	--	----------------	---

Subfamily Termitinae

Genus *Amitermes* Silvestri, 1901

<i>A. acinacifer</i> Sands, 1959		K		
<i>A. evuncifer</i> Silvestri, 1912a	U	K		
<i>A. hastatus</i> (Haviland, 1898)			T	
<i>A. lönnbergianus</i> (Sjöstedt, 1911d)		K	T	
<i>A. messinae</i> Fuller, 1922		K	T	Z
<i>A. sciangallorum</i> Ghidini, 1941		K ₄	T	
<i>A. somaliensis</i> Sjöstedt, 1927		K		
<i>A. spinifer</i> Silvestri, 1914-15	U	K	T	
<i>A. stephensoni</i> Harris, 1957		K ₁		
<i>A. truncatidens</i> Sands, 1959			T	
<i>A. unidentatus</i> (Wasmann, 1897)	U	K	T	Z

Genus *Microcerotermes* Silvestri, 1901

<i>M. brachygnathus</i> Silvestri, 1914-15			T	
<i>M. edentatus</i> Wasmann, 1911	U		T	
<i>M. masaiaticus</i> Harris, 1954		K	T	
<i>M. nemoralis</i> Harris, 1954			T	
<i>M. parvulus</i> (Sjöstedt, 1911c)			T	
<i>M. parvus</i> (Haviland, 1898)	U	K ₄	T	
<i>M. zuluensis</i> Holmgren, 1913a			T	Z

Genus *Crenetermes* Silvestri, 1912a

<i>C. albotarsalis</i> (Sjöstedt, 1897)			T	
<i>C. mixtus</i> Williams, 1962		K	T	

Genus *Euchilotermes* Silvestri, 1914-15

<i>E. umbraticola</i> (Williams, 1954)		K	T	
--	--	---	---	--

Genus *Ophiotermes* Sjöstedt, 1924a

<i>O. ugandensis</i> Sjöstedt, 1925	U			
-------------------------------------	---	--	--	--

Genus *Megagnathotermes* Silvestri 1914-15

<i>M. sp.</i>		K ₃		
---------------	--	----------------	--	--

Genus *Cubitermes* Wasmann, 1906

<i>C. falcifer</i> Williams, 1966			T	
<i>C. fulvus</i> Williams, 1966			T	
<i>C. glebae</i> (Sjöstedt, 1913)		K	T	
<i>C. inclitus</i> Silvestri, 1912b	U	K	T	
<i>C. latens</i> Williams, 1966			T	
<i>C. montanus</i> Williams, 1966			T	
<i>C. muneris</i> (Sjöstedt, 1913)		K	T	
<i>C. oblectatus</i> Harris, 1958			T	
<i>C. orthognathus</i> (Emerson, 1928)	U	K	T	
<i>C. pallidiceps</i> (Sjöstedt, 1913)			T	
<i>C. sankurensis</i> Wasmann, 1911			T	
<i>C. speciosus</i> Sjöstedt, 1924a	U			
<i>C. tenuiceps</i> (Sjöstedt, 1913)			T	
<i>C. testaceus</i> Williams, 1966	U	K		
<i>C. ugandensis</i> Fuller, 1923	U	K	T	
<i>C. umbratus</i> Williams, 1954		K	T	
<i>C. zavattarii</i> Ghidini, 1937		K	T	

Genus *Lepidotermes* Sjöstedt, 1924b

<i>L. goliathi</i> (Williams, 1954)			T	
<i>L. planifacies</i> (Williams, 1954)			T	

Genus <i>Noditermes</i> Sjöstedt, 1924a			
<i>N. wasambaricus</i> Williams, 1954		K	T
Genus <i>Basidentitermes</i> Holmgren, 1912			
<i>B. amicus</i> Harris, 1936			T
<i>B. aurivillii</i> (Sjöstedt, 1897)	U		
Genus <i>Ceratotermes</i> Silvestri, 1914-15			
<i>C. rhinoceros</i> (Sjöstedt, 1905)	U		T
Genus <i>Angulitermes</i> Sjöstedt, 1924a			
<i>A. truncatus</i> Sjöstedt, 1926a	U	K	T
Genus <i>Promirotermes</i> Silvestri, 1914-15			
<i>P. bellicosi</i> (Wasmann, 1912)		K ₄	T
<i>P. gracilipes</i> Schmitz, 1917	U	K	
<i>P. massaicus</i> (Sjöstedt, 1907a)		K ₄	T
Genus <i>Pericapritermes</i> Silvestri, 1914-15			
<i>P. dumicola</i> Harris, 1954			T
<i>P. gloveri</i> Harris, 1951			T

Subfamily Macrotermitinae

Genus <i>Acanthotermes</i> Sjöstedt, 1898			
<i>A. acanthothorax</i> (Sjöstedt, 1898)	U		
Genus <i>Pseudacanthotermes</i> Sjöstedt, 1924a			
<i>P. grandiceps</i> (Sjöstedt, 1915)		K ₂	T ₁
<i>P. militaris</i> (Hagen, 1858)	U	K	T
<i>P. piceus</i> (Sjöstedt, 1911a)	U		
<i>P. spiniger</i> (Sjöstedt, 1900a)	U	K ₂	T ₁
Genus <i>Synacathotermes</i> Holmgren, 1910			
<i>S. zanzibarensis</i> (Sjöstedt, 1915)		K	T Z
Genus <i>Allodontermes</i> Silvestri, 1914			
<i>A. morogorensis</i> Harris, 1936			T
Genus <i>Macrotermes</i> Holmgren, 1909			
<i>M. bellicosus</i> (Smeathman, 1781)	U	K	T
<i>M. falciger</i> (Gerstäcker, 1891)	U	K	T
<i>M. herus</i> (Sjöstedt, 1914a)		K	T
<i>M. michaelsoni</i> (Sjöstedt, 1914a)		K ₃	T
<i>M. subhyalinus</i> (Rambur, 1842)	U	K	T
<i>M. ukuzii</i> (Fuller, 1922)			T
<i>M. vitrialatus</i> (Sjöstedt, 1899)			T ₁
Genus <i>Odontotermes</i> Holmgren, 1912			
<i>O. amanicus</i> Sjöstedt, 1925		K ₃	T
<i>O. amaniensis</i> (Sjöstedt, 1924b)			T
<i>O. anceps</i> (Sjöstedt, 1911e)			T
<i>O. apollo</i> (Sjöstedt, 1905)			T
<i>O. aurora</i> (Sjöstedt, 1904)			
<i>O. badius</i> (Haviland, 1898)	U	K	T Z
<i>O. boranicus</i> (Ghidini, 1937)		K	T
<i>O. caffrariae</i> (Sjöstedt, 1897)			T
<i>O. culturarum</i> Sjöstedt, 1924c	U	K ₃	T

<i>O. egregius</i> Sjöstedt, 1925		K		
<i>O. elgonensis</i> (Sjöstedt, 1925)		K		
<i>O. fallax</i> Sjöstedt, 1924c		K		
<i>O. fulleri</i> (Emerson, 1928)	U	K ₃		
<i>O. kibarensis</i> (Fuller, 1923)	U	K ₃	T	
<i>O. latericius</i> (Haviland, 1898)	U		T	
<i>O. mediocris</i> (Sjöstedt, 1911e)		K	T ₂	
<i>O. microps</i> (Sjöstedt, 1899)			T	
<i>O. monodon</i> (Gerstäcker, 1891)	U	K	T	Z
<i>O. montanus</i> Harris, 1960		K		
<i>O. nolaensis</i> Sjöstedt, 1924c	U	K ₃		
<i>O. palmquisti</i> (Sjöstedt, 1907a)		K	T	
<i>O. patruus</i> (Sjöstedt, 1913)	U ₁	K ₁		
<i>O. ramulosus</i> (Sjöstedt, 1904)			T	
<i>O. rectanguloides</i> Sjöstedt, 1924c	U	K ₁	T	
<i>O. stercorivorus</i> (Sjöstedt, 1907a)		K ₃	T	
<i>O. tanganicus</i> Sjöstedt, 1924c		K	T	
<i>O. terricola</i> (Sjöstedt, 1902a)		K	T	
<i>O. transvaalensis</i> (Sjöstedt, 1902b)	U		T ₁	
<i>O. zambesiensis</i> (Sjöstedt, 1914b)		K _{3,4}	T	Z ₁

Genus *Ancistrotermes* Silvestri, 1914-15

<i>A. cavithorax</i> (Sjöstedt, 1899)	U			
<i>A. equatorius</i> (Harris, 1966b)	U			
<i>A. latinotus</i> (Holmgren, 1912)	U	K	T	
<i>A. microdens</i> (Harris, 1966b)	U	K		

Genus *Microtermes* Wasmann, 1902

<i>M. alluaudanus</i> (Sjöstedt, 1915)		K	T	
<i>M. kasaiensis</i> (Sjöstedt, 1913)	U ₁	K ₁		
<i>M. luteus</i> (Harris, 1954)		K ₂	T	
<i>M. magnocellus</i> (Sjöstedt, 1915)			T	
<i>M. redenianus</i> (Sjöstedt, 1904)			T	
<i>M. usambaricus</i> Sjöstedt, 1926b			T	
<i>M. vadschaggae</i> (Sjöstedt, 1907a)		K ₄	T	

Subfamily Nasutitermitinae

Genus *Nasutitermes* Dudley, 1890

<i>N. arboreus</i> (Smeathman, 1781)	U			
<i>N. chapini</i> Emerson, 1928	U			
<i>N. elegantulus</i> (Sjöstedt, 1911b)	U ₁			
<i>N. fulleri</i> Emerson, 1928	U			
<i>N. incurvus</i> (Sjöstedt, 1924b)	U			
<i>N. infuscatus</i> (Sjöstedt, 1902c)		K	T	Z
<i>N. kempae</i> Harris, 1954		K	T	Z
<i>N. latifrons</i> (Sjöstedt, 1896)	U			
<i>N. maculiventris</i> (Sjöstedt, 1904)	U			
<i>N. schoutedeni</i> (Sjöstedt, 1924b)	U			
<i>N. torquatus</i> (Sjöstedt, 1924c)	U			

Genus *Rhadinotermes* Sands, 1965a

<i>R. coarctatus</i> (Sjöstedt, 1902b)			T	
--	--	--	---	--

Genus *Grallatotermes* Holmgren, 1912

<i>G. africanus</i> Harris, 1954		K	T	
----------------------------------	--	---	---	--

Genus *Trinervitermes* Holmgren, 1912

<i>T. auriterrae</i> Sjöstedt, 1926c	U			
--------------------------------------	---	--	--	--

<i>T. bettonianus</i> (Sjöstedt, 1905)	U	K	T	Z
<i>T. carbonarius</i> Sjöstedt, 1926d	U			
<i>T. dispar</i> (Sjöstedt, 1902d)	U	K	T	
<i>T. ebenerianus</i> Sjöstedt, 1926e	U			
<i>T. geminatus</i> (Wasmann, 1897)	U			
<i>T. graciosus</i> (Sjöstedt, 1924b)	U	K	T	
<i>T. lutzii</i> (Emerson, 1928)	U			
<i>T. occidentalis</i> (Sjöstedt, 1904)	U			
<i>T. oeconomus</i> (Trägårdh, 1904)	U			
<i>T. rapulum</i> (Sjöstedt, 1904)			T	Z
<i>T. ruficeps</i> (Holmgren, 1913a)			T	
<i>T. segelli</i> (Sjöstedt, 1907a)			T	
<i>T. togoensis</i> (Sjöstedt, 1899)	U			
<i>T. trinervius</i> (Rambur, 1842)	U			

Genus *Mimeuterme* Silvestri, 1914-15

<i>M. binghami</i> Sands, 1968	K	
<i>M. majusculus</i> Sands, 1965b		T

ACKNOWLEDGEMENTS

The authors are grateful for the help of K.M. Shepherd of the Tropical Development and Research Institute (formerly Centre for Overseas Pest Research), London, for help in tracing some of the references.

REFERENCES

- BANKS, N. 1906. Two new termites. Ent. News 17: 336-337.
- 1918. The termites of Panama and British Guiana. Bull. Amer. Mus. Nat. Histo. 38:659-667.
- BOUILLON, A. 1970. Termites of the Ethiopian Region. Ch. 5 : 153-280 In: Biology of Termites. I. K. Krishna & F.M. Weesner, eds. Academic Press.
- BOUILLON, A. & G. MATHOT 1965. Quel est ce termite africain? Zooleo 1:1-114. Leopoldville.
- BOUILLON, A. & G. MATHOT 1966. Quel est ce termite africain? Zooleo Suppl. 1:1-23. Kinshasa.
- BUXTON, R.D. 1979. The role of termites in the ecology of Tsavo National Park, Kenya. D. Phil. thesis, University of Oxford.
- COATON, W.G.H. 1949. Notes on some South African species of the families Hodotermitidae and Kalotermitidae. J. Ent. Soc. Sth. Afr. 12:13-77.
- 1955. New Isoptera from Belgian Congo. (With redescrptions of some named species). J. Ent. Soc. Sth. Afr. 18:109-136.
- DUDLEY, P.H. 1890. Termites of the Isthmus of Panama. Part II. Trans. N.Y. Acad. Sci. 9:157-180.
- EMERSON, A.E. 1928. Termites of the Belgian Congo and the Cameroon. Bull. Am. Mus. Nat. Hist. 57:401-574.
- 1956. Ethospecies, ethotypes, taxonomy and evolution of *Apicotermes* and *Allognathotermes* (Isoptera: Termitidae). Am. Mus. Novit. 1771:1-31.
- FROGGATT, W.W. 1896. Australian Termitidae. Part I. Proc. Linn. Soc. New South Wales 21:510-552.
- FULLER, C. 1922. The termites of South Africa. S. Afr. J. Nat. Hist. 3:70-131.
- 1923. Two new termites from Uganda. Ann. Mag. Nat. Hist. 11:191-192.
- 1925. The termites of South Africa III. S. Afr. J. Nat. Hist. 5:167-246.
- GERSTACKER, A. 1891. Die Von Hern Dr. Fr. Stuhlmann in Ostafrika gesammelten Termiten, Odonaten und Neuropteren. Jb. Hamb. Wiss. Anst. 9:183-191.
- GHIDINI, G.M. 1937. Missione del Prof. Edoardo Zavattari nel paese dei Borana. Nuove specie di Termitidi. (Diagnose Preventive) Bol. Soc. Ent. Ital. 69:141-143.
- 1941. Nove specie di termitide. Bol. Soc. Ent. Ital. 73:30-34.
- HAGEN, H.A. 1853. Hr. Peters berichtete über die von ihm gesammelten und von Hr. Dr. Hermann Hagen bearbeiteten Neuropteren aus Mossambique. Bericht Königl. Preuss. Akad. Wiss. Berlin. 479-481.

- 1858. Monographie der Termiten, Part 2. Linn Entomol. 12:1-342.
- HARRIS, W.V. 1936. A list of the termites of Tanganyika Territory, with descriptions of two new species. Bull. Ent. Res. 27:361-368.
- 1948. Termites of the Uganda Protectorate. Proc. R. Ent. Soc. Lond. (B) 17:73-83.
- 1951. Further records of East African termites. Proc. R. Ent. Soc. Lond. (B) 20:25-28.
- 1954. Further records of East African Termites. II. Proc. R. Ent. Soc. Lond. (B) 23:127-137.
- 1957. Isoptera. Report on the British Museum Expedition to South-West Arabia 1937-38 1(28):421-433.
- 1958. Isoptera. Explor. Parc Natn. Upemba. I. Mission G.F. de Witte. 52:3-26
- 1960. Further records of East African termites — III. Proc. R. Ent. Soc. Lond. (B), 29:17-21.
- 1966a. On the genus *Coptotermes* in Africa (Isoptera: Rhinotermitidae). Proc. R. Ent. Soc. Lond. (B) 35:161-171.
- 1966b. The genus *Ancistrotermes* (Isoptera). Bull. Br. Mus. Nat. Hist. (Ent.) 18:1-20.
- HAVILAND, G.D. 1898. Observations on termites with descriptions of new species. J. Linn. Soc. (Zool.) 26:358-442.
- HOLMGREN, N. 1909. Termitenstudien. I Anatomische Untersuchungen. K. Svenska VetenskAkad. Handl. 44:1-25.
- 1910. Das System der Termiten. Zool. Anz. 35:284-286.
- 1911. Termitenstudien 2. Systematik der Termiten. Die Familien Mastotermitidae, Protermitidae and Mesotermitidae. K. Svenska VetenskAkad. Handl. 46:1-88.
- 1912. Termitenstudien 3. Systematic der Termiten. Die Familie Mertatermitidae. K. Svenska VetenskAkad. Handl. 48:1-66.
- 1913a. Termiten aus Natal und den Zululande. Gesammelt von Dr. Ivar Trägårdh. Ent. Tidskr. Arg. 34:321-366.
- 1913b. Termitenstudien 4. Versuch einer Systematischen Monographie der Termiten der Orientalischen Region. K. Svenska VetenskAkad. Handl. 50:1-276.
- KEMP P.B. 1955. The termites of North-eastern Tanganyika, their distribution and biology. Bull. Ent. Res. 46:113-135.
- KRISHNA K. 1961. A generic revision and phylogenetic study of the family Kalotermitidae (Isoptera). Bull. Am. Mus. Nat. Hist. 122:309-408.
- & A.E. EMERSON 1962. New species of the Genus *Glyptotermes* (Froggatt) from the Papuan, Oriental, Ethiopian and Neotropical Regions (Isoptera, Kalotermitidae). Am. Mus. Novit. 2089:65.
- RAMBUR, J.P. 1842. Histoire naturelle des Insectes. Neuropteres. p534. Paris.
- RUELLE, J.E. 1970. A revision of the termites of the genus *Macrotermes* from the Ethiopian region (Isoptera: Termitidae). Bull. Br. Mus. Nat. Hist. (Ent.) 9:365-444.
- 1977. *Macrotermes michaelsoni* (Sjöstedt) a new name for *Macrotermes mossambicus* (Hagen) (Isoptera: Termitidae). J. Ent. Soc. Sth. Afr. 40:119.
- SANDS, W.A. 1957. A revision of the East African Nasutitermitinae (Isoptera). Bull. Br. Mus. Nat. Hist. (Ent.) 5:1-28.
- 1959. A revision of the termites of the genus *Amitermes* from the Ethiopian region, (Isoptera, Termitidae, Amitermitinae). Bull. Br. Mus. Nat. Hist. (Ent.) 8:127-156.
- 1965a. A revision of the termite subfamily Nasutitermitinae (Isoptera, Termitidae) from the Ethiopian region. Bull. Br. Mus. Nat. Hist.(Ent.)Suppl. 4:172pp.
- 1965b. A new species of *Mimeutermes* Silvestri and the imago of *Nasutitermes diabolus* (Sjöstedt) from Africa (Isoptera: Nasutitermitinae). Proc. R. Ent. Soc. Lond. (B) 34:132-136.
- 1968. New species and records of Nasutitermitinae (Isoptera:Termitidae) from Africa. Proc. R. Ent. Soc. Lond. (B) 37:163-169.
- 1972. The soldierless termites of Africa (Isoptera: Termitidae). Bull. Br. Mus. Nat. Hist. (Ent.) Suppl. 18:1-244.
- SCHMITZ, H. 1917. Drei neue Termiten vom belgischen Kongo. Tijdschr. Ent. 60:225-231.
- SHIRAKI, T. 1909. [On the Japanese termites.] Trans. Ent. Soc. Japan 2:229-242.
- SILVESTRI, F. 1901. Nota preliminare sui Termitidi sud-americani. Boll. Mus. Zool. Anat. Comp. Torino 16:1-8.
- 1909. Isoptera. In: Die Fauna Südwest-Austral. 2:279-314. W. Michaelsen & R. Hartmeyer, eds.
- 1912a. Termiti raccolte da L. Fea alla Guinea Portoghese e alla isole S. Thome, Annobon, Principe e Fernando Poo. Ann. Mus. Civ. Stor. Nat. Genova 5:211-255.
- 1912b. Termitidi raccolte da S.A.R. la Duchessa d'Aosta nelle regione dei grandi laghi dell' Africa equatoriale. Ann. Mus. Zool. Univ. Napoli 3:1-5.
- 1914. Zoological Results of the Abor Expedition, 1911-12. 32. Termitidae. Rec. Indian Mus. Calcutta 8:425-435.

- 1914-15. Contribuzione alla conoscenza dei Termitidae e Termitofili dell' Africa occidentale. 1. Termitidi. Boll. Lab. Zool. Gen. Agr. R. Scuola Agric. Portici 9:1-146.
- 1918. Contribuzione alla conoscenza dei Termitidi e Termitofili dell' Africa occidentale. Boll. Lab. Zool. Gen. Agr. R. Scuola Agric. Portici 12:287-346.
- SJÖSTEDT, Y. 1896. Termiten aus Kamerun. Ent. Tidskr. 17:297-298.
- 1897. Neue Termiten aus West-Africa (Vorläufige Mitteilung) Ent. Tidskr. 18:123-126.
- 1898. Zwei neue Termiten aus der Westküste Afrikas. Ent. Tidskr. 19:204-205.
- 1899. Neue afrikanische Termiten (Vorläufige Mitteilung). Ent. Nachr. 25:34-39.
- 1900a. Vorläufige Diagnosen einiger afrikanischen Termiten. Ent. Tidskr. 20:278.
- 1900b. Monographie der Termiten Afrikas. K. Svenska VetenskAkad. Handl. 34:1-236.
- 1902a. Termites novos ex Africa Reportatos. Ent.Tidskr. 23:40.
- 1902b. Eine neue termite aus kamerun. Ent. Tidskr.23:252.
- 1902c. Neue afrikanische Termiten. Ent. Tidskr. 23:302-304.
- 1904. Monographie der Termiten Afrikas. K. Svenska VetenskAkad. Handl. 38:1-120.
- 1905. Ueber eine Termitensammlung aus Kongo und anderen Teilen von Africa. Ark. Zool. 2:1-20.
- 1907a. Termitidae. Wiss. Ergebn. schwed. zool. Exped. Kilimandjaro – Meru, 1905-6. 3:1-24.
- 1907b. Ueber eine Termitensammlung aus Kongo. Ent. Tidskr. 28:233-250.
- 1911a. Neue Ost- und Westafrikanische Termiten. Ent. Tidskr. 32:173-188.
- 1911b. Neue afrikanische Termiten im Schwedischen Reichsmuseum. Ark. Zool. 7:1-18.
- 1911c. Zur Termitenfauna Kongos. Ent. Tidskr. 32:137-170.
- 1911d. Ueber die von Herrn Professor Einar Lönneberg in British Ostafrika eingesammelten Termiten. Ark. Zool. 7:1-3.
- 1911e. Termitidae novae a Cl. Dom. Maurice de Rothschild ex Aethiopia reportatae. Ent. Tidskr. 32:171-172.
- 1913. Über Termiten aus dem inneren Congo, Rhodesia, und Deutsch-Ostafrika. Rev. Zool. Afr. 2:354-391.
- 1914a. Isoptera. In: Beitr. Kennt. Land und Süßwasserfauna Deutsch-Südwest Afrikas 1:73-92. W. Michaelsen, ed.
- 1914b. Termiten aus Zambesi, Rhodesia, Nyassa und Süd-Nigeria. Ark. Zool. 8:1-9.
- 1915. Insectes Pseudonevropteres. 1. Termitidae. Voyage Ch. Alluad et R. Jeannel en Afrique Orientale 1911-12:1-18.
- 1924a. Neue Arten und Gattungen afrikanischer Termiten. Rev. Zool. Afr. 12:253-257.
- 1924b. Neue Termiten im Kongo-Museum. Rev. Zool. Afr. 12:39-42.
- 1924c. Neue Afrikanischer Termiten. Rev. Zool. Afr. 12:490-497.
- 1925. Neue Termiten aus Afrika und Madagaskar. Konowia 4:53-55.
- 1926a. Termiten aus Accra. Ent. Tidskr. 47:238-246.
- 1926b. Revision der Termiten Afrikas. 3. Monographie. K. Svenska VetenskAkad. Handl. 3:1-419.
- 1926c. Neue Termiten aus der Goldküste. Ark. Zool. 18:1-5.
- 1926d. Kongo-termiten aus dem Ituri- und Uelegebiet. Rev. Zool. Afr. 14:140-164.
- 1926e. Wissenschaftliche Ergebnisse der mit Unterstützung der Akademie der Wissenschaften in Wien aus der Erbschaft Treitl von F. Werner unternommenen zoologischen Expedition nach dem Anglo-Agyptischen Sudan (Kordofan) 1914. 21. Isoptera. Akad. Wiss. Wien Math.-Nat. 100:71-76.
- 1927. Termiten aus dem Somaliland. Rev. Zool. Afr. 15:97-104.
- SMEATHMAN, H. 1781. Some account of the termites which are found in Africa and other hot climates. Phil. Trans. R. Soc. 71:139-192.
- SNYDER, T.E. 1949. Catalog of the Termites (Isoptera) of the world. Smithson. Misc. Coll. 112:1-490.
- TRÄGARDH, I. 1904. Termiten aus dem Sudan. Results Swed. Zool. Exped. Egypt and White Nile, 1901. 12:1-47.
- WASMANN, E. 1896. Neue Termitophilen und Termiten aus Indien. Viaggio di Leonardo Fea in Birmania e Regioni Vicine. Ann. Mus. Civ. Stor. Nat. Genova 16:613-630.
- 1897. Termiten von Madagaskar und Ostafrika. (Wiss. Ergeb. der Reisen in Madagaskar und Ostaf. 1889-95 von Dr. A. Voeltzkow.) Abh. Senckenb. Naturforsch. Ges. 21:137-182.
- 1902. Termiten, Termitophilen und Myrmecophilen gesammelt auf Ceylon von Dr. W. Horn. 1899 mit andern ostindischen Material. Zool. Jahrb. Syst. 17:99-164.
- 1906. Beispiele rezenter Artenbildung bei Ameisen und Termitengästen. Biol. Zentralbl. 26:565-580.
- 1911. Zur Kenntnis der Termiten und Termitengäste von Belgischen Kongo. Rev. Zool. Afr. 1:91-117, 145-176.
- 1912. Neue Beiträge zur Kenntnis der Termitophilen und Myrmecophilen. Z. Wiss. Zool., Leipzig. 101:70-115.

-
- WILKINSON, W. 1954. Three new species of Kalotermitidae (Isoptera) from East Africa. Proc. R. Ent. Soc. Lond. (B) 23:75-82.
- 1958. Two new species of *Kaloterмес* Hagen from West Africa. Proc. R. Ent. Soc. Lond. (B) 27:109-115.
- 1959. Four new species of Kalotermitidae from East Africa (Isoptera). Proc. R. Ent. Soc. Lond.(B) 28:61-72.
- WILLIAMS, R.M.C. 1954. New East African Termitinae (Isoptera: Termitidae). Proc. R. Ent. Soc. Lond. (B) 23:215-227.
- 1962. A correction concerning two East African Termitinae (Isoptera). Proc. R. Ent. Soc. Lond. (B) 31:127-130.
- 1966. The East African termites of the genus *Cubiterмес* (Isoptera: Termitidae). Trans. R. Ent. Soc. Lond. 118:73-118.

Received 5 January 1984

Editors: J.J. Hebrard, D. Widdowson

NOTICE TO CONTRIBUTORS

Papers on natural history subjects will be considered on the understanding that these are being offered exclusively to the Society and have not been submitted, at the same time, to any other journal.

They should be addressed to the Editors, Journal of the East Africa Natural History Society and National Museum, P.O. Box 44486, Nairobi, and be accompanied by a covering letter from the author responsible for correspondence and decisions regarding the typescript.

Two copies of the contribution should be forwarded to the Society; a further copy should be kept by the author for reference. The typescript should be on A4 size paper. Use one side only, double-spaced with margins of at least 5 cm at the top and left-hand side of the pages to allow for editorial instruction to printers. The pages must be numbered and all measurements are to be in metric units.

The title page should contain the title of the article followed by the name of the author(s) and institution(s) where the research was carried out. A present address, if applicable, should be included as a footnote.

Abstract to be on the second page and contain not more than 150 words. State the purpose of the study, procedures, main findings and conclusions. This should be intelligible in itself without reference to the paper.

Nomenclature In cases where there are well known and accepted English names, e.g. for birds and larger mammals, these should be used throughout the text, accompanied by the scientific name on first mention. Authorities should be given beside the generic and specific names, when quoted for the first time, for all groups, with the exception of ornithological papers not dealing with taxonomic discussion.

Text This is usually, but not necessarily, divided into parts with the headings Introduction, Methods, Results and Discussion, these being broken up with sub-headings where necessary. Main heads should be centred on the page and typed in capital letters. Subheads should be ranged to the left margin and typed in capitals. Any further headings should start with a capital letter followed by small letters on the left margin. No headings should be underlined. Underlining is an instruction to the printer to use italic type and should be reserved for all generic and species names, foreign words not adopted into English and for descriptions of bird or animal vocalisation.

Acknowledgements As acknowledgements may imply endorsement of the data and conclusions contained in the authors work, it is advisable to obtain permission before quoting persons who have made contributions to the study.

References Care should be taken to see that all references quoted in the text are given in full, in this section. To avoid confusion, references to books and periodicals should not be abbreviated and neither should they be underlined. For example:

(in text) Cave & Macdonald (1955) or (Cave & Macdonald 1955)

(in reference list) CAVE, F.O. & MACDONALD, J.D. 1955. Birds of the Sudan, Oliver & Boyd, London.

Tables Each table must be typed, double-spaced on a separate sheet and numbered. Leave good spaces between columns and omit internal vertical and horizontal rules. Cite tables in the text in consecutive order.

Illustrations Submit two sets of figures which should be well drawn on bristol board or heavy tracing paper with a photographed or xeroxed copy. Lettering must be of first quality (e.g. lettraset) and consideration must be given to size when reduced. Typewritten or freehand lettering will not be accepted unless put onto an overlay which can be followed by the printers for typesetting. Each figure should have a label pasted on its back giving the number of the figure, caption details and accreditation. Cite each figure in the text in consecutive order. A separate caption sheet should be added to the typescript. Photographs are acceptable if they have good definition and contrast and should be produced on glossy paper.

Proofs The author will be sent one set of galley proofs for correction of typographical errors. Authors may be charged for any changes from the original typescript made by him at this stage, and which result in additional printing expense. Plates or page proofs will not be sent.

Published material The author is entitled to 25 copies free of charge. Further copies can be supplied at cost price, provided the order is placed when the typescript is submitted. If there is more than one author, 30 copies will be sent to the corresponding author for distribution.

The society is supported entirely by membership subscriptions and may not, for financial reasons, be able to accept all submissions of value.

Wherever possible an author should seek a grant, from his institution or other source, to help with costs of publication.

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 01313 7526